Adjusting the Workload of an Under-utilized Server by Scheduling Supplementary Work

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Abstract⎯This paper addresses an important question of how to achieve an appropriate and nearly uniform work-load for an under-utilized staff in a waiting line situation by scheduling an appropriate amount of supplementary work during the idle time. We present an M/G/1 queue with a special server's vacation policy to model this situation. In this system, after serving all arriving customers, the server can perform a random maximum number H of possible supplementary jobs before staying idle. The distribution of H can be determined by a supplementary job assignment policy to reduce the idle time proportion. Major performance measures are obtained to evaluate this class of policies. Numerical examples are presented to illustrate the application of this study.

Keywords⎯Scheduling, M/G/1 queue, Server vacations, Idle-time utilization, Stochastic decomposition property